

Claims

1. Device for manufacturing lollipops, comprising a rotatably driven drum provided with lollipop moulds at its circumference, a supply for supplying a strand of lollipop material to the lollipop moulds and a discharge for lollipops formed in the lollipop moulds, wherein the drum is disposed on a hollow shaft and wherein the lollipop moulds are disposed at the circumference of a casing, which defines an annular space with the hollow shaft, wherein the lollipop moulds for instance comprise lower moulds that are solid with the casing and upper moulds that are hinged to the lower moulds, wherein the hollow shaft is provided with a first passage and a second passage, each forming a fluid connection between the cavity in the hollow shaft and the annular space, wherein the hollow shaft is provided with a fluid supply and a fluid discharge, which fluid supply is in fluid connection with a pressure source for cooling air, wherein the casing with the lollipop moulds forms a detachable part of the device and can be slid on the hollow shaft when being placed or removed.
2. Device according to claim 1, wherein the casing is rotatable about the hollow shaft.
3. Device according to claim 1 or 2, wherein the hollow shaft is provided with a longitudinal partition which separates the supply from the discharge.

4. Device according to claim 1, 2 or 3, wherein the inner surface of the casing is provided with cooling ribs.

5. Device for manufacturing lollipops, comprising a rotatably driven drum provided with lollipop moulds at its circumference, a supply for supplying a strand of lollipop material to the lollipop moulds and a discharge for lollipops formed in the lollipop moulds, wherein the lollipop moulds are disposed at the circumference of a casing, wherein the lollipop moulds are bounded by mould members of which at least one is movable from a free position to a wanted mould position while exerting pressure on the lollipop mass in the lollipop mould, wherein the device is furthermore provided with means for stopping the motion of the mould member to the wanted mould position before reaching the wanted mould position in case of a deviation in said motion detected by detection means.

6. Device according to claim 5, wherein the detection means in question are adapted for detecting an impediment in the movement of the part in question.

7. Device according to claim 5, wherein the detection means in question are adapted for detecting a certain pressure build-up.

8. Device according to claim 5, 6 or 7, wherein the part in question is an upper mould known per se, which is hinged to the drum and movable between an open position for access of lollipop material or removal of the lollipop formed, to or from, respectively, the lollipop mould in question.

9. Device according to claim 8, wherein use is made of a body having the shape of a segment of a circle, which is movable in radial direction with respect to the drum, wherein, preferably, the body having the shape of a segment of a circle is provided with a carrier and an insert piece of hard material for exerting press-on forces on the upper moulds, wherein the insert

piece preferably is detachably attached to the carrier and preferably is adjustably tiltable with respect to the carrier in order to be suited to a drum of an altered diameter.

10. Device according to any one of the claims 5-9, wherein the part in question is a pressure/mould piston movable in drum-axial direction, wherein the device is furthermore provided with means for pressing the mould piston in the mould cavity.

11. Device according to claim 10, wherein the means for pressing the mould piston in the mould cavity comprise a piston rod connected to the mould piston and a cam track for axial movement of the end of the piston rod that is opposite the mould piston.

12. Device according to claim 11, wherein the detection means are adapted for detecting a movement of the cam track or the construction parts connected thereto.

13. Device according to claim 11 or 12, wherein the piston rods are provided with a roller for engaging the cam track.

14. Device according to any one of the preceding claims, wherein the means in question are adapted for operation by medium/fluid pressure, particularly gas pressure (and then be pneumatically active), between a fixed part and a movable part.

15. Device for manufacturing lollipops, comprising a rotatably driven drum provided with lollipop moulds at its circumference, a supply for supplying a strand of lollipop material to the lollipop moulds and a discharge for lollipops formed in the lollipop moulds, wherein the drum is disposed on a hollow shaft and wherein the lollipop moulds are disposed at the circumference of a casing, wherein pressure/mould pistons that are movable in drum-axial

direction are provided for pressing the lollipop material in the lollipop moulds, wherein the pistons are provided with operation protrusions, such as piston rods, that are guided by a cam track, which is provided with an inclined run-in portion and a post-pressing portion, where the pressure is substantially preserved for a certain track length/period, wherein the post-pressing portion preferably runs straight, preferably according to a line in a radial plane that is transverse to the drum axis.

16. Device according to claim 15, wherein the piston rods are provided with a roller for engaging the cam track.

17. Device according to claim 16, wherein between the end of the run-in portion and the post-pressing portion, a recessed, slightly pressure-reducing press-on portion is present and/or wherein the post-pressing portion in pressure direction extends further than the end of the run-in portion.

18. Device for manufacturing lollipops, comprising a rotatably driven drum provided with lollipop moulds at its circumference, a supply for supplying a strand of lollipop material to the lollipop moulds and a discharge for lollipops formed in the lollipop moulds, wherein the lollipop moulds are disposed at the circumference of a casing, wherein the lollipop moulds each comprise a first mould, such as a lower mould that is fixed to the casing and a second mould, such as an upper mould that is hinged to the casing, which are movable with respect to each other between an open position, for access of lollipop material or removal of a formed lollipop, to or from, respectively, the lollipop mould in question and a position closed by first press-on means, in which the lollipop can be formed under pressure, wherein the device is furthermore provided with means for limiting the pressure to a certain wanted value.

19. Device according to claim 18, wherein the pressure limiting means are adapted for limiting the press-on force of the upper moulds on the lower

moulds.

20. Device according to claim 19, wherein the first press-on means for the upper moulds comprise a first press-on member that is movably disposed on the device.

21. Device according to claim 20, provided with means that are operative by medium/fluid pressure for moving the first press-on member with respect to a fixed part on the device.

22. Device according to claim 21, wherein the means operative by medium/fluid pressure are pneumatic.

23. Device according to claims 21 or 22, wherein the pneumatic means comprise a bellows operative between the first press-on member and the fixed part.

24. Device according to any one of the claims 20-23, wherein the first press-on member comprises a body having the shape of segment of a circle that is movable in radial direction with respect to the drum.

25. Device according to claim 24, wherein the body having the shape of a segment of a circle is provided with a carrier and an insert piece of hard material for exerting press-on forces on the upper moulds, wherein the insert piece preferably is detachably attached to the carrier.

26. Device according to claim 25, wherein the insert piece is adjustably tiltable with respect to the carrier.

27. Device according to any one of the claims 20-26, furthermore provided with means for establishing a movement of the first press-on member in radial outward direction with respect to the drum, as well as with means for

influencing the press-on force of the first press-on member in response to a signal of the means for establishing a movement of the first press-on member.

28. Device according to any one of the claims 18-27, wherein a mould piston that is movable in drum-axial direction has been placed at every lollipop mould, wherein the device is furthermore provided with second press-on means for pressing the mould piston into the mould cavity, wherein the pressure limiting means are adapted for limiting the press-on force exerted by the mould piston.

29. Device according to claim 28, wherein the second press-on means for the mould pistons comprise a second press-on member, that is disposed on the device so as to be movable in drum-axial direction.

30. Device according to claim 29, provided with means operative by medium/fluid pressure for moving the second press-on member with respect to a fixed part on the device.

31. Device according to claim 30, wherein the means operative by medium/fluid pressure are pneumatic.

32. Device according to claims 30 and 31, wherein the pneumatic means comprise a bellows that is operative between the second press-on member and the fixed part.

33. Device according to any one of the claims 29-32, wherein the second press-on member comprises a body having a piloting edge for drum-axial, press-on motion of the free end of pressure pins that project from the side of the mould pistons that faces away from the mould cavities.

34. Device according to any one of the claims 29-33, wherein the second

press-on member is attached to fixed parts of the device by means of a parallelogram structure.

35. Device according to any one of the claims 29-34, furthermore provided with means for establishing a movement of the second press-on member in axial outward direction with respect to fixed parts of the device, as well as with means for influencing the press-on force of the second press-on member in response to a signal of the means for establishing a movement of the second press-on member.

36. Device according to claims 34 and 35, wherein the establishing means are operative near a relatively freely movable vertex of the parallelogram structure.

37. Device for manufacturing lollipops, comprising a rotatably driven drum provided with lollipop moulds at its circumference, a supply for supplying a strand of lollipop material to the lollipop moulds and a discharge for lollipops formed in the lollipop moulds, wherein the lollipop moulds are disposed at the circumference of a casing, wherein the device is furthermore provided with means for bringing a lollipop stick into the lollipop mould, oriented in a direction parallel to the drum axis, wherein the lollipop heads preferably are situated at the side of the sticks facing the device, wherein the device comprises means for taking the lollipops out of the lollipop moulds and transporting them, with the lollipop sticks parallel to the drum axis, in a first orientation with the head proximal to the device, wherein the device is furthermore provided with means for converting the orientation to a second orientation, wherein the discharge is adapted for discharging the lollipops in the second orientation.

38. Device according to claim 37, wherein the conversion means are adapted for a conversion in an orientation of 180 degrees.

39. Device according to claim 37 or 38, wherein the conversion means comprise a number of cooperating transport disks, of which the axes of rotation are perpendicular to each other.

40. Device according to claim 39, wherein the conversion means comprise a train of at least two transport disks.

41. Device for transferring lollipops provided with sticks from a location of receipt to a location of discharge, comprising a rotatably driven disk and a series of stick clamps fixedly attached thereto, which stick clamps comprise two clamping members or clamping jaws, and are movable and preferably biased to a -stable- closed position, in which they are able to clamp a stick, preferably parallel to the disk axis, wherein preferably by means of fixedly positioned operation means, such as a cam engaging on an operation arm of one of the clamping members, the clamping members can be urged apart to an open position, in which a stick can be received or taken out, respectively, wherein preferably one of the clamping members is immovably attached on the disk, and the other clamping member is biased towards it and is temporarily movable away from the immovably attached clamping member, against the biasing force, by the operation means.

42. Device for manufacturing lollipops, comprising a frame and a drum disposed thereon, which is provided with a casing with a circulating series of lower moulds thereon and a series of upper moulds that are movable between an open position, for receipt of lollipop material or discharge of a lollipop, and a closed position for forming a mould cavity, wherein the casing is detachably connected to the frame as one unity.

43. Device according to claim 42, wherein the casing is disposed on a hollow shaft, that is stationary and on which bearings for the casing are provided, wherein the casing is detachable from the hollow shaft and the hollow shaft is attached to the frame.

44. Device for manufacturing lollipops, comprising a frame and a drum disposed thereon, which drum is provided with a casing having a circulating series of lower moulds thereon and a series of upper moulds that are movable between an open position, for receipt of lollipop material or discharge of a lollipop, and a closed position for forming a mould cavity, wherein the upper moulds are provided with an accommodation space for slidably accommodating a guide that is fixed to the frame for said motion of the upper moulds.

45. Device according to claim 44, wherein the guide is formed like a formed piece, for instance a moulded piece, such as a bent plate, or a (bent) rod.

46. Device according to claim 44 or 45, wherein the guide defines a guiding edge and the accommodation space surrounds the guiding edge for more than 180 degrees, considered in cross-section perpendicular to the guiding edge.

47. Device according to claim 44, 45 or 46, wherein in the closed position of the upper moulds the accommodation space is oriented axially away from the frame.

48. Device according to any one of the claims 44-47, wherein the guide has a path length corresponding to the length of the path of the casing between the point of receipt and the point of discharge.

49. Device according to any one of the claims 44-48, wherein the upper moulds are hinged to the drum, wherein the hinge is situated closer to the frame than the free end of the upper moulds, preferably approximately halfway the upper moulds.

50. Device provided with one or more of the characterising measures

described in the attached description and/or shown in the attached drawings.

51. Method comprising one or more of the characterising steps described in the attached description and/or shown in the attached drawings.